

# Work Order ID 60714

Tuesday, July 20, 2010 12:47:20 PM

Page 1

Item ID: D212-664-201TRN

Accept

Revision ID:

Item Name: Crosstube Turning Detail

Start Date: 7/20/2010 Start Qty: 1.00

Required Date: 7/27/2010 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

Draw Nbr

Revision Nbr

D212-664-241

Rev D

100



Mori Seiki

Mori Seiki CNC Lathe Large

MORI SEIKI CNC LATHE LARGE

0.00

Memo

0.00

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA114  
2-Turn first side as per Folio FA114  
3- File transition lines smooth.

QM 10-07-26

110



QC

Quality Control

QC1- Inspect dimensions to dimension sheet

0.00

Memo

0.00

QM 10-07-26

120



Mori Seiki

Mori Seiki CNC Lathe Large

MORI SEIKI CNC LATHE LARGE

0.00

Memo

0.00

1-Turn second side as per Folio FA114  
2- File transition lines smooth.  
3-Remove sand and plugs  
4- scribe batch # and part # as per dwg

QM 10-07-26

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

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Page 2

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Start Date: 7/20/2010 Start Qty: 1.00

Required Date: 7/27/2010 Req'd Qty: 1.00

Reference:

Accept

Setup Start

Stop

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

130

QC1- Inspect dimensions to dimension sheet

0.00

QC

Memo

0.00

Quality Control

0.11 10 07-2600

140

QC8- Inspect parts - second check

0.00

QC

Memo

0.00

Quality Control

81010267

⑦

150

Crosstubes Chemical Conversion

0.00

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat as per within 24 hours of machining

①X

MB 10207-28

W/O:		WORK ORDER CHANGES					
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Page 3

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Required Date: 7/27/2010 Req'd Qty: 1.00

Reference:

Accept

Setup Start

Stop

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

160

QC3- Inspect Part Finish

0.00

QC

Memo

0.00

Quality Control

1 M 10/17/28

170

Packaging

0.00

Packaging

Memo

0.00

Packaging

Identify and stock in kanban rack  
Location: *X file al*

14 Q MB 10-02-28

180

QC21- Final Inspection - Work Order Release

0.00

QC

Memo

0.00

Quality Control

10/07/28  
pl 10-7-28  
②

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# Picklist Print

Tuesday, July 20, 2010 12:47:24 PM

Page 1

Work Order ID: 60714

Parent Item: D212-664-201TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 7/20/2010

Required Date: 7/27/2010

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec  
IPP Rev B 08.04.02 Removed polish EC verified DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6006-129		Manufactured	No			120	Each	41.0000	1	1			



Crosstube Material



A.M. 10-07-26 (C)

Location

Loc Qty

Loc Code

LG

41

23970

2

26550

14

34690

11

38338

14


W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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<b>DART AEROSPACE LTD</b>		<b>Work Order:</b>	<i>60714</i>
<b>Description:</b> Crosstube Assembly (205/212 High Aft)		<b>Part Number:</b>	D212-664-241
<b>Inspection Dwg:</b> D212-664-241 Rev: C		Page 1 of 1	

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	<i>0.200</i>	/		
	R0.063	+/-0.010	<i>R0.063</i>	/		<i>Caliper 0.04</i>
	2.990	+0.005/-0.000	<i>2.991</i>	/		<i>PLG</i>
	5.237	+/-0.030	<i>5.237</i>	/		<i>*Vern</i>
	2.600	+0.005/-0.000	<i>2.605</i>	/		"
	2.686	+0.005/-0.000	<i>2.689</i>	/		"
	2.770	+0.005/-0.000	<i>2.795</i>	/		"
	2.854	+0.005/-0.000	<i>2.859</i>	/		"
	2.938	+0.005/-0.000	<i>2.943</i>	/		"
	3.021	+0.005/-0.000	<i>3.026</i>	/		"
	3.133	+0.005/-0.000	<i>3.137</i>	/		"
	3.179	+0.005/-0.000	<i>3.184</i>	/		"
SIDE B	0.200	+/-0.010	<i>0.200</i>	/		<i>Caliper 0.04</i>
	R0.063	+/-0.010	<i>R0.063</i>	/		<i>2-6</i>
	2.990	+0.005/-0.000	<i>2.991</i>	/		<i>vern</i>
	5.237	+/-0.030	<i>5.237</i>	/		"
	2.600	+0.005/-0.000	<i>2.604</i>	/		"
	2.686	+0.005/-0.000	<i>2.686</i>	/		"
	2.770	+0.005/-0.000	<i>2.775</i>	/		"
	2.854	+0.005/-0.000	<i>2.859</i>	/		"
	2.938	+0.005/-0.000	<i>2.943</i>	/		"
	3.021	+0.005/-0.000	<i>3.026</i>	/		"
	3.133	+0.005/-0.000	<i>3.137</i>	/		"
	3.179	+0.005/-0.000	<i>3.184</i>	/		"
	124.36	+/-0.020	<i>124.360</i>	/		<i>Tape measure 0.01</i>

<b>Measured by:</b>	<i>0.2</i>	<b>Audited by:</b>	<i>8</i>	<b>Prototype Approval:</b>	N/A
<b>Date:</b>	<i>10.07.26</i>	<b>Date:</b>	<i>10/07/27</i>	<b>Date:</b>	N/A

Rev	Date	Change	Revised by	Approved
A	05.04.27	New Issue (P/O D412-664-201)	KJ/JLM	
B	06.03.09	Tolerance for 5.237 was +/-0.001	KJ/JLM	
C	07.05.08	Dwg Rev. updated	KJ/JLM <i>28</i>	<i>12</i>

W/O:			WORK ORDER CHANGES					
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Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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**NOTE:** Date & initial all entries

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

# **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6006-129  
FINISHED LENGTH = 124.362±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)  
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER

NO. 60714

BS10-7-20

**RELEASED**  
R 2009-10-29

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA DRAWING NO. REV. D D212-664-241 SHEET 1 OF 4 TITLE SCALE CROSSTUBE ASSY (205/212 HI AFT) NTS DATE 09.09.30 <small>COPYRIGHT © 2005 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	
DRAWN	RF		
CHECKED	PH		
MFG. APPR.	PH		
APPROVED	PH		

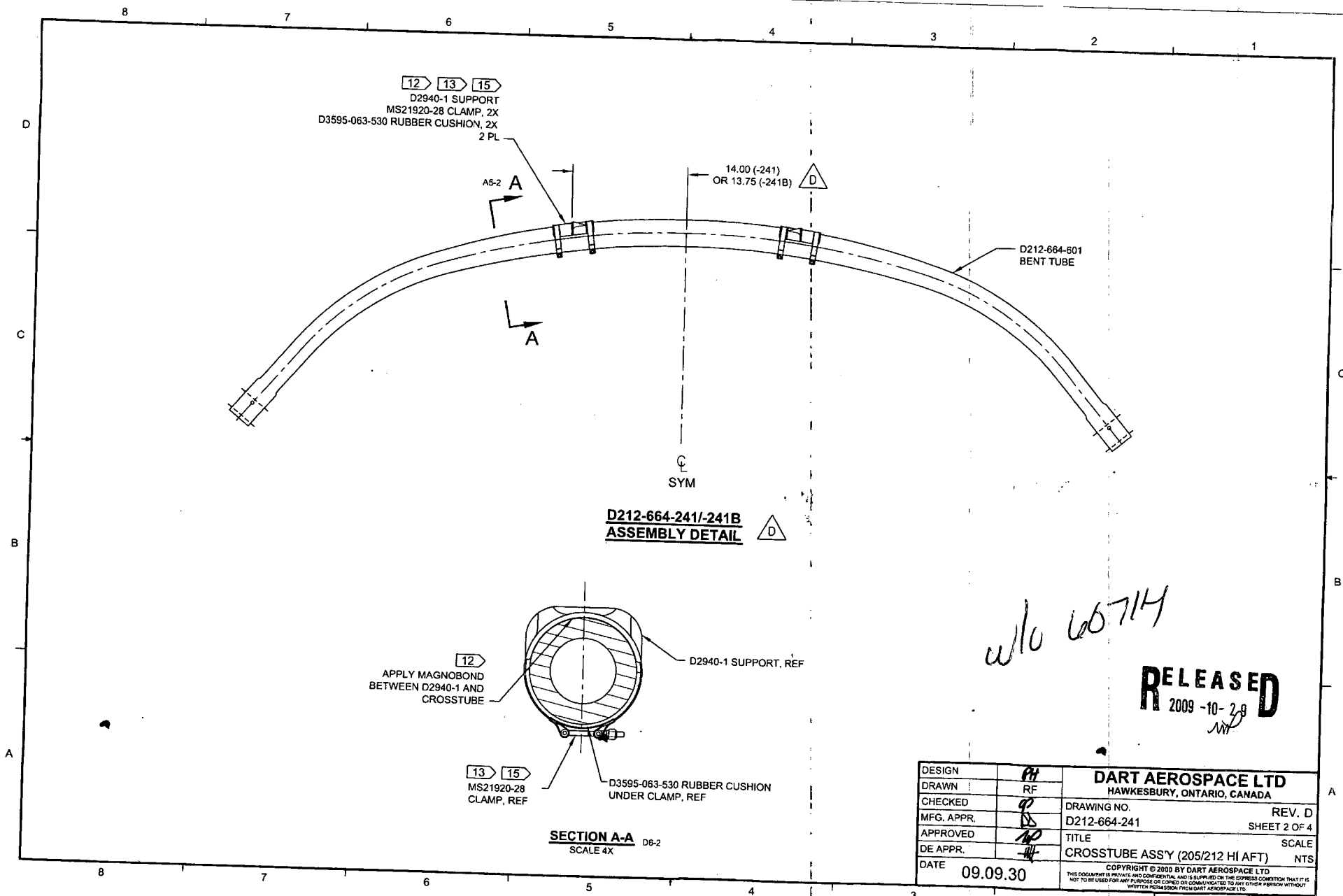
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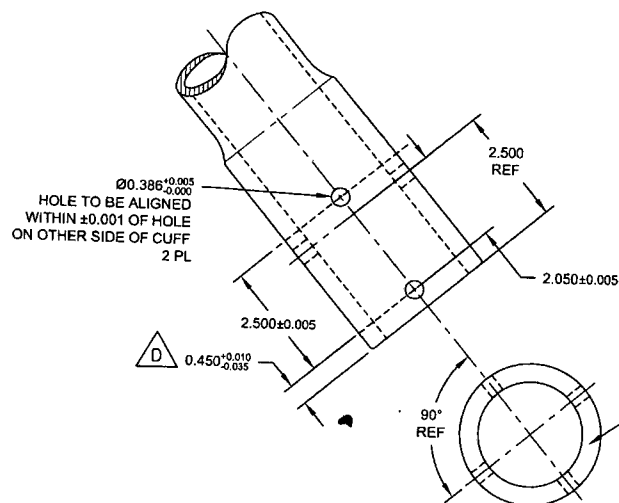
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Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

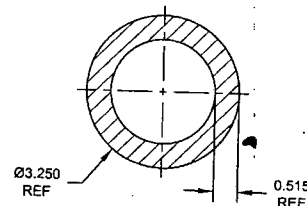
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**NOTE:** Date & initial all entries

**D212-664-601** 10 D  
**BENDING AND DRILLING DETAIL**



**VIEW C-C: CUFF DETAIL** D2-3  
 SCALE 3X



**SECTION B-B** D4-3  
 SCALE 4X

DESIGN	PH	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	QF	DRAWING NO.	REV. D
MFG. APPR.	AS	D212-664-241	SHEET 3 OF 4
APPROVED	AS	TITLE	SCALE
DE APPR.	AS	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
DATE	09.09.30	<small>COPYRIGHT © 2000 BY DART AEROSPACE LTD                      THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

*w/o 60714*

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 2009-10-29  
*MD*

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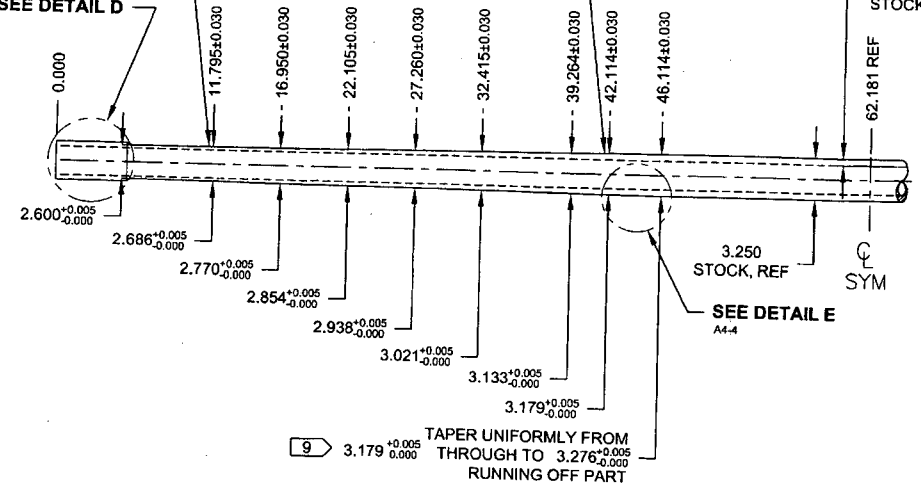


R100.0 TRANSITION  
BETWEEN TAPERED  
SECTIONS

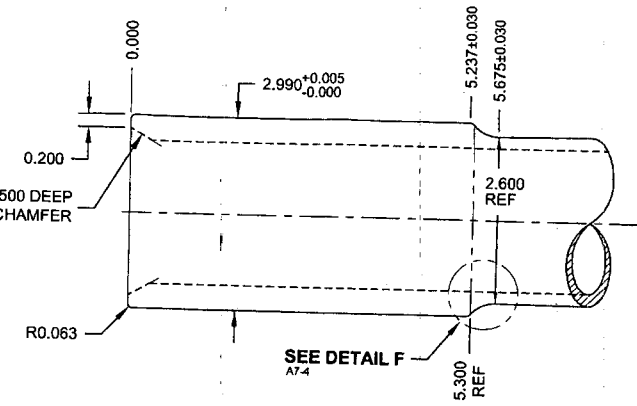
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BETWEEN TAPERED  
SECTIONS

0.515 WALL  
STOCK, REF

SEE DETAIL D

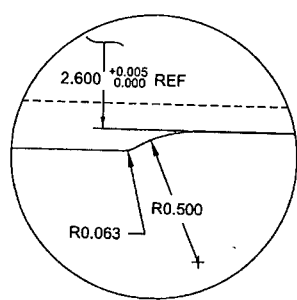


9  
30° X 0.500 DEEP  
CHAMFER

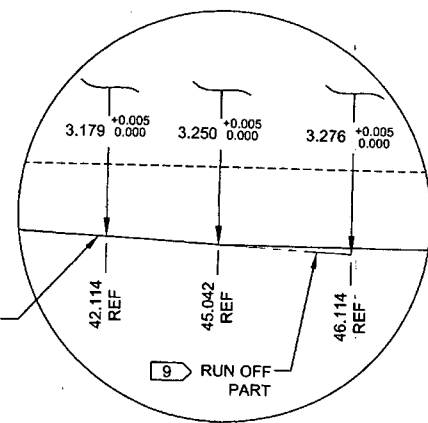


DETAIL D:  
CROSSTUBE CUFF DB-4  
SCALE 5X

D212-664-241TRN  
TURNING DETAIL



DETAIL F:  
CUFF TRANSITION C2-4  
SCALE 10X



DETAIL E:  
TAPER RUN-OFF C5-4  
NOT TO SCALE

w/o 60714

RELEASED  
2009-10-29

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9	DRAWING NO.	REV. D
MFG. APPR.	10	D212-664-241	SHEET 4 OF 4
APPROVED	10	TITLE	SCALE
DE APPR.	10	CROSSTUBE ASSY (205/212 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD	
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